CALTRANS

ENVIRONMENTAL HANDBOOK
VOLUME 3

BIOLOGICAL RESOURCES

CHAPTER 1

GENERAL INFORMATION

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1-1 INTRODUCTION

Caltrans must comply with Federal and State environmental laws and regulations designed to protect biological resources in all phases of project planning and development, construction, permitting, and maintenance.

1-1.1 Use

This volume provides guidance to identify and evaluate biological resources, process biological resource documents, and implement all biologically related construction, maintenance, and encroachment activities.

Situations in biological resource management that are not covered in Volume 3 should be handled on a case-by-case basis. Districts are encouraged to consult with Headquarters staff members at any time, especially when unusual situations occur. Communication between Districts is also highly recommended for the purpose of sharing similar experiences.

Volume 3 of the Environmental Handbook should be used with other project planning and development guides and references including Volume 1 of the Environmental Handbook and the Project Development Procedures Manual.

1-1.2 Purpose

This handbook:

- presents Caltrans policies and procedures regarding biological resources;
- details procedures and activities required by law, regulation, and Executive Order pertaining to biological resources;
- sets forth biological resource management roles and responsibilities; and
- sets forth guidelines to promote consistency, uniformity, and effective handling of biological resources in the conduct of Caltrans' activities.

1-1.3 Transportation and Biological Resources

Caltrans is required to comply with Federal and State biological resource laws and regulations. The following is a summary of the evolution of these laws and Caltrans' involvement in managing biological resources under its jurisdiction.

In the mid-1960s, increased public concern and support for protection of the natural environment resulted in stronger and more comprehensive Federal and State laws. The National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act of 1970 (CEQA) established environmental policy specifically addressing the impacts of human activities on the natural and human environment. These laws require public agencies to be responsive to the effects of their actions on the environment, including biological resources.

In 1973, Congress passed the Federal Endangered Species Act (FESA). A similar California Endangered Species Act (CESA) was passed in 1985.

In response to public concern over the loss of wetlands, in the mid-1970s the Army Corps of Engineers (ACOE) expanded its jurisdiction over fill materials in traditional navigable waters to cover essentially all water bodies, including wetlands. In 1977, a Federal Executive Order was issued which directed Federal agencies to avoid impacts to wetlands whenever there was a practicable alternative.

The 1973 legislation that created Caltrans from the Division of Highways emphasized consideration of the environment and required that "environmental impacts of transportation should be taken into consideration." The Director's Environmental Policy (1992) states that "Caltrans protects and enhances the environment..." and "evaluates the environmental benefits and consequences of its activities and implements practices that minimize environmental impacts."

1-2 LAWS AND REGULATIONS

1-2.1 Federal Laws and Regulations

National Environmental Policy Act (42 U.S.C. 4321 et seq.). NEPA declares a continuing Federal policy "to use all practicable means and measures...to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations." NEPA directs "a systematic, interdisciplinary approach" to planning and decision making and requires environmental statements for "major Federal actions significantly affecting the quality of the human environment." Implementing regulations by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500-1508) requires Federal agencies to identify and assess reasonable alternatives to proposed actions that will restore and enhance the quality of the human environment and avoid or minimize adverse environmental impacts. Federal agencies are further directed to emphasize significant environmental issues in project planning and to integrate impact studies required by other environmental laws and Executive Orders into the NEPA process. The NEPA process should therefore be seen as an overall framework for the environmental evaluation of Federal actions.

Endangered Species Act of 1973 (16 U.S.C. 1531-1543). This act and subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend.

- **Section 7** requires Federal agencies, in consultation with, and with the assistance of the Secretary of the Interior or the Secretary of Commerce, as appropriate, to insure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. The U. S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) share responsibilities for administering the Act. Regulations governing interagency cooperation under Section 7 are found at 50 CFR Part 402. The opinion issued at the conclusion of consultation will include a statement authorizing take that may occur incidental to an otherwise legal activity.
- **Section 9** lists those actions that are prohibited under the Act. Take of a species listed in accordance with the Act is prohibited. There are two processes whereby take is allowed when it is incidental to an otherwise legal activity.
- **Section 10** provides a means whereby a non-Federal action with a potential to result in the take of a listed species could be allowed under an incidental take permit. Application procedures are found at 50 CFR Parts 13 and 17 for species under the jurisdiction of FWS and 50 CFR Parts 217, 220 and 222 for species under the jurisdiction of NMFS.

Migratory Bird Treaty Act (16 U.S.C. 703-711). This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season.

Clean Water Act (33 U.S.C. 1251-1376). The Clean Water Act (CWA) provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters.

- **Section 401** requires that an applicant for a Federal license or permit that allows activities resulting in a discharge to waters of the United States, must obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards administer the certification program in California.
- **Section 402** establishes a permitting system for the discharge of any pollutant (except dredge or fill material) into waters of the United States.
- **Section 404** establishes a permit program administered by ACOE regulating the discharge of dredged or fill material into waters of the United States (including wetlands). Implementing regulations by ACOE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404 (b)(1) Guidelines and were developed by the Environmental Protection Agency (EPA) in conjunction with ACOE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 et seq.). Section 10 of the Rivers and Harbors Act is administered by ACOE. This section requires permits in navigable waters of the U. S. for all structures such as riprap and activities such as dredging. Navigable waters are defined as those subject to the ebb and flow of the tide and susceptible to use in their natural condition or by reasonable improvements as means to transport interstate or foreign commerce. The ACOE grants or denies permits based on the effects on navigation. Most activities covered under this act are also covered under Section 404 of CWA.

Fish and Wildlife Coordination Act (16 U.S.C. 661-666). This act applies to any Federal project where the waters of any stream or other body of water are impounded, diverted, deepened, or otherwise modified. Project proponents are required to consult with FWS and the appropriate state wildlife agency. These agencies prepare reports and recommendations that document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources. The term "wildlife" includes both animals and plants. Provisions of the Act are implemented through the NEPA process and Section 404 permit process.

National Wild and Scenic Rivers Act (16 U.S.C. 1271-1287). This act is administered by a variety of State and Federal agencies. Designated river segments flowing through Federally managed lands are administered by the land managing agency (e.g., U. S. Forest Service, Bureau of Land Management, and the National Park Service). River segments flowing through private lands are administered by the Resources Agency in conjunction with local government agencies. The Act prohibits Federal agencies from activities that would adversely affect the values for which the river was designated. Caltrans consults with the managing agencies during the NEPA process on projects that affect designated rivers or their immediate environments. This early consultation reduces potential conflicts with wild and scenic river values that are protected by the Act.

Executive Order 11988 Floodplain Management (May 24, 1977). This order directs all Federal agencies to avoid the long-term and short-term adverse impacts associated with floodplain modification and to avoid direct or indirect support of floodplain development whenever there is a practicable alternative.

Executive Order 11990 Protection of Wetlands (May 24, 1977). This order establishes a National policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The U. S. Department of

Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On Federally funded projects, impacts on wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding in the final environmental document. An additional requirement is to provide early public involvement in projects affecting wetlands. The Federal Highway Administration (FHWA) provides technical assistance in meeting these criteria (FHWA Technical Advisory 6640.8A) and reviews environmental documents for compliance.

1-2.2 State Laws and Regulations

California Environmental Quality Act (P.R.C. 21000 et seq.). CEQA establishes State policy to prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures. CEQA applies to actions directly undertaken, financed, or permitted by State lead agencies. Regulations for implementation are found in the State CEQA Guidelines published by the Resources Agency. These guidelines establish an overall process for the environmental evaluation of projects that is similar to that promulgated under NEPA. The Guidelines make provisions for joint NEPA/CEQA documents.

California Endangered Species Act (Fish and Game Code 2050 et seq.). This act establishes the policy of the State to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that State agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that affect both a state and federal listed species, compliance with the Federal Endangered Species Act (FESA) will satisfy CESA if the Department of Fish and Game (DFG) determines that the federal incidental take authorization is "consistent" with CESA under F&G Code Section 2080.1. For projects that will result in a take of a state only listed species, Caltrans must apply for a take permit under section 2081(b).

Native Plant Protection Act (Fish and Game Code 1900-1913). California's Native Plant Protection Act (NPPA) requires all State agencies to utilize their authority to carry out programs to conserve endangered and rare native plants. Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the DFG at least 10 days in advance of any change in land use. This allows DFG to salvage listed plant species that would otherwise be destroyed. Caltrans is required to conduct botanical inventories and consult with DFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

California Wild and Scenic Rivers Act (P.R.C. 5093.50 et seq.) This act preserves certain designated rivers in their free-flowing state. These rivers must possess extraordinary scenic, recreational, fishery, or wildlife values. The Resources Agency is responsible for coordinating activities of State agencies that may affect these designated rivers.

Sections 1601-1603 of the Fish and Game Code. Under these sections of the Fish and Game Code, Caltrans and other agencies are required to notify DFG prior to any project that would divert, obstruct or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, DFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications and bid documents for the project.

1-2.3 Agreements and Understandings

Memorandum of Understanding (MOU) with Fish and Wildlife Service (November 1988). This MOU establishes procedures for the early and continuous coordination of transportation project development activities between Caltrans and FWS.

MOU with the Department of Fish and Game (December 1990). This MOU ensures that State transportation projects are planned, designed, constructed and maintained to protect fish and wildlife resources in conformance with CEQA and CESA.

Memorandum of Agreement (MOA) between FHWA, ACOE, EPA, FWS, DFG, and Caltrans (May 1991), Early Mitigation Planning for Transportation Improvements in California. This MOA establishes a process to identify and evaluate valuable natural resources and habitat at the earliest stages of transportation improvement planning. It provides a framework to implement coordinated mitigation planning at the beginning of the project development process leading to an agreement on mitigation strategy for guidance during project design.

Planning Guidelines for Standard Approaches to Mitigation Site Monitoring and Maintenance - under November 1988 MOU with Sacramento Office of FWS (November 1991). This MOU provides planning guidelines to improve the success of project mitigation within the jurisdiction of Caltrans and FWS.

MOU - NEPA and Clean Water Act Section 404 Integration Process (March 3, 1994). This MOU ensures the earliest possible consideration of environmental concerns pertaining to waters of the U. S., including wetlands, at the transportation project planning, programming, and project development stages by integrating section 404 into the NEPA process.

1-2.4 Caltrans' Policies

Caltrans' purpose and vision is to promote the State's economic vitality and enhance the quality of life for the people of California by providing for mobility of people, goods, services, and information while protecting the environment and addressing social needs.

Transportation projects are planned and constructed to avoid or minimize impacts to biological resources whenever practicable.

Caltrans evaluates and plans for mitigation of adverse impacts to natural resources during the early stages of transportation planning and decision making.

Caltrans works closely with resource agencies and FHWA in the development and implementation of mitigation for project impacts necessary to satisfy State and Federal laws while ensuring that mitigation necessitated by impacts to sensitive resources is a reasonable expenditure of highway funds.

If impact avoidance is not possible, the first consideration is to minimize impacts on-site.

If mitigation on-site is not practical, off-site compensation may be required. Off-site mitigation may include land acquisition and habitat improvement. The following is to be considered:

- avoid purchasing or improving habitat on small isolated sites;
- if possible, achieve compensation in advance of project impacts;
- develop mitigation banks when appropriate opportunities exist; and
- consider Conservation Easements before considering right of way purchase.

Caltrans provides for monitoring and sustained maintenance and operation of mitigation sites.

When possible, Caltrans turns over mitigation sites to responsible public or private resource organizations for long-term management.

Caltrans maintains a mitigation site inventory providing information on costs and performance success.

1-3 ROLES AND RESPONSIBILITIES

Caltrans' environmental policies encourage coordination among the responsible units. The following section describes the organization and functions of the unit responsible for biological resource management within Caltrans, and identifies the roles and responsibilities of biological staff.

The responsibility for managing biological resources under Caltrans' jurisdiction is placed with the Environmental Offices at the district level and the Environmental Program at Headquarters.

1-3.1 District Roles And Responsibilities

The District Environmental Offices independently administer and perform all biological functions for the District, with assistance or review by the Environmental Program on request.

District Environmental Offices have the ultimate responsibility for the quality and timeliness of all biological studies, regardless of who prepares the studies.

Initial Planning Stage. The biologist provides the project planners with information on biological resources that potentially exist in the project area. The biologist uses a literature search and field visits to provide information on biological resources that might be affected by proposed actions. The biologist may do additional studies to better advise the planners if the potential exists for impacts to resources which are sufficiently serious to stop or severely delay a project. In addition, biologists may be requested to develop study schedules that estimate the time needed to complete biological surveys, coordinate with resource agencies, and write reports. The biologist may also be requested to provide an estimate of what mitigation may be required if a certain action is carried out.

Project Development Stage. Once project alternatives are selected for further study, the biologist is responsible to determine the potential biological resource impacts. When there is a potential for adverse impacts, the biologist works with the Project Manager and project team to determine if the project can be modified to avoid the impacts. After making necessary project adjustments, if there are still impacts that require mitigation, the biologist works with the project team to develop feasible mitigation. Affected functional units, such as construction and maintenance, should be consulted if they are not currently active members of the project team. Personnel from the resource agencies may also be a part of these discussions because of the status of the resources.

Some projects may require permits or agreements. The groundwork for these documents should be developed during the initial stages of the environmental document. Caltrans and the appropriate resource agency should reach an agreement on the requirements to obtain those permits or agreements. These conditions can then be incorporated into the environmental document and become an integral part of the project.

The biologist prepares the Natural Environment Study (NES). The NES details all of the biological studies, impact analyses, and agreed to mitigation measures. The generalist uses the NES to complete the Biological Section of the environmental document. If consultation for endangered species is required, the biologist may need to develop a Biological Assessment that focuses only on those studies and impact analyses required for listed, proposed, and candidate endangered and threatened species.

The biologist insures that the memo from the Environmental Office to the Resident Engineer's (RE) Pending File includes all biological requirements identified during the environmental process. This memo will also alert the RE that the biologist would like to be notified of the pre-job conference. Prior to project

advertisement, the biologist should review the draft Plans, Specifications and Estimate (PS & E) to assure that all biological commitments are included in the contract and there is sufficient funding to accomplish those commitments.

Construction Stage. The biologist is often requested to participate in the pre-job conference to clarify biological issues and constraints for the RE and staff and to ensure the contractor's consideration of biological issues during construction. A major role of the biologist during construction is to be available for consultation. The biologist may be requested to field review a project when a change order that will modify the impacts on resources is being considered, or when there is a resource identified that was overlooked during environmental review.

The responsibilities of the biologist during construction can range from occasional consultation to daily monitoring. A frequent requirement of endangered species consultation is that a qualified biologist be present during a phase of construction that has the potential to harm a species. Permits issued by ACOE and coastal zone permitting agencies may require regular or periodic monitoring of construction activities by a biologist if sensitive resources are involved. In some cases, the biologist may be required to oversee the construction phase of a mitigation site.

The RE has the ultimate responsibility for the construction site and for ensuring the contractor's compliance with applicable laws, permits, and contract plans and specifications. Authority for directing the contractor's work must be delegated to the biologist by the RE.

Post Construction Stage. After construction the biologist is responsible for monitoring the success of any biological mitigation that was a condition of construction. A major component of habitat replacement is annual monitoring of any plantings and recommending corrective measures, if appropriate. This monitoring requirement, generally established in the regulatory permit, may last until the habitat reaches a certain stage, which will vary for different habitats, plantings, and conditions. Annual monitoring requirements will usually be determined in negotiations between Caltrans biologists and resource and regulatory agencies. The monitoring requirements are subject to final approval by the Project Manager.

Agency or Developer Funded Projects. Agency or developer funded projects are not technically Caltrans projects but they ultimately become a part of the highway system. The District Director delegates authority to a Caltrans Project Manager to oversee Caltrans' interest in these types of projects. It is up to the Project Manager to consult with specialists to ensure that the information gathered is pertinent to obtain proper approvals and permits from resource agencies. When FHWA funds or approvals are involved in the project, the Project Manager should ensure that the information gathered will meet the needs of FHWA to complete agency coordination. When there is no FHWA action, the Project Manager should ensure that any agreements the local agency makes toward permits and approvals are achievable and acceptable to Caltrans. The appropriate method to meet these goals is to involve the specialists at all stages of the process. The Project Manager is responsible for accepting or rejecting recommendations made by specialists. The difference between agency or developer funded projects and Caltrans' projects is that the biologist usually has a more active role in the development of Caltrans' projects.

1-3.2 Headquarters Responsibilities

The Environmental Program at Headquarters is responsible to:

- provide assistance and expertise to districts for the development and processing of biological studies;
- develop and maintain natural resource handbooks and manuals;
- prepare and analyze recommendations on proposed legislation;

- develop and propose departmental policy to ensure conformity with laws and regulations and to promote uniformity in addressing biological issues;
- provide liaison and assistance to districts in resolving issues with State and Federal agencies;
- identify, manage, and perform research on environmental topics to produce information for statewide application;
- identify need, develop, and provide or conduct training in technical biological areas;
- identify need, develop methodology, and initiate procedure to capture cost and estimate future resources required for biological measures (e.g., mitigation site monitoring, mitigation banks, endangered species, etc.); and
- develop, gather, and disseminate information, technical data, processes, procedures, etc. which may improve the biological program or assist district biologists.

CHAPTER 2

NATURAL ENVIRONMENT STUDY

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NATURAL ENVIRONMENT STUDY

2-1 INTRODUCTION

A Natural Environment Study (NES) describes the existing biological environment and how the project alternatives affect that environment. The NES is the technical backup for statements made in the environmental document concerning plants, animals, and natural communities occurring in the project study area.

2-2 BACKGROUND RESEARCH

To gather information on the biological resources in the project area, the District Biologist must review the proposed project description and materials, be familiar with the project area, consider comments received during the project scoping process, and review existing sources of information known about the project area.

An initial site visit to observe the type of natural communities and their condition in the project area will help focus the collection of background information. Background information is used to plan the extent of biological studies needed prior to conducting field investigations. This initial planning step is necessary to ensure that studies address resources of concern that may be affected by the project while at the same time avoiding lengthy discussions of the local or regional biota. Biological resources addressed in the NES are limited to those pertaining to the study area and likely to be impacted by the project.

The District Biologist reviews substantive resource issues identified during the project scoping process before initiating biological studies. From the information obtained in the background research and the comments received during the scoping process, the District Biologist develops a list of sensitive species and habitats that may be present within the project area.

Information about biological resources in the project area is available from a myriad of sources. Some of the common sources of biological information include species lists solicited from the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game (DFG), maps such as the National Wetlands Inventory Maps compiled by FWS, soil surveys compiled by the Natural Resources Conservation Service, environmental documents for nearby projects, and documents prepared by resource agencies concerning species potentially found in the study area. A standard source is the most recent records of the California Natural Diversity Data Base (CNDDB) RareFind for the USGS quadrangle on which the project occurs, and for adjacent quadrangles as habitat conditions and regional species distributions dictate. A 10-mile radius from the project site normally provides a useful frame of reference for developing a list of sensitive taxa to be considered during project studies. As a rule, the biologist considers all species whose range includes the project site and whose life requirements may be met by the habitat types that are present within the survey area. Consult the most recent edition of the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California for information on the distribution and habitat requirements of sensitive plant taxa.

2-3 ISSUE IDENTIFICATION/ SCOPING

The scoping process provides many of the issues that require discussion in an environmental document. The District Biologist supplements this process as needed with site visits and interviews with local experts and agency personnel familiar with sensitive resources potentially found in the project area.

2-3.1 Level of Detail

The level of detail must be sufficient to determine if the project will result in a significant impact. The NES describes the project setting in such detail that project planners and the public have a clear idea of the nature, distribution, and abundance of resources. The NES must address whether a sensitive or biologically important resource occurs in the project area, whether the resource will be affected, and whether the project impact is significant.

As the sensitivity of the resource increases, the level of detail in the NES will also increase. Threatened and endangered species, as well as proposed species, candidate species, and some special status resources require a thorough analysis of potential project impacts. A determination of the potential for take of a listed species or critical habitat is required.

2-3.2 Area of Direct and Indirect Effect

The District Biologist coordinates with the Project Engineer to develop the limits of the project study area. A project study area includes the footprint of the completed project, new right of way limits, areas needed for utility relocation, construction access roads, driveway realignments, and construction easements. Within these limits the biologist evaluates biological resources for both direct and indirect effects. If impacts resulting from the project extend beyond the project limits, the impacted areas must be included in the analysis.

Area of Direct Effect. The area of direct effect is where construction activity results in the removal of biotic resources and landforms. The National Environmental Policy Act (NEPA) Regulations define direct effects as those "which are caused by the action and occur at the same time and place." Resources lost under the footprint of the action are obvious direct effects, such as filling a wetland to build a highway. Less obvious direct effects might be where a natural process has been blocked, such as blocking a migration corridor or disrupting a breeding cycle.

Area of Indirect Effect. As defined in the NEPA Regulations indirect effects are those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

When evaluating an action for indirect social effects, the District Biologist coordinates with a socioeconomic planner to determine indirect social changes that may occur from the construction of a project. The socioeconomic planner determines probable changes likely to occur in the project area. The District Biologist evaluates the biological resources that will be impacted because of these indirect social effects.

2-3.3 Contacts with Agencies and Individuals

Throughout the development of the NES, the District Biologist contacts individuals and agencies for information or negotiation purposes. A section of the NES should discuss the coordination that has taken place and agreements that have been made. Contacts are made primarily to gather information or to negotiate modifications in the project design.

Information. As needed, the District Biologist will interview individuals who are familiar with the biological resources of the project area, including local agency and academic personnel who are experts on the biota of the study area. These experts may provide additional, unpublished information regarding the distribution and importance of resources within the project area. A District Biologist should attend the project's public information meetings and workshops to establish contacts with property owners. Property owners can supply knowledge of prior and current land uses and the ecological character of the area.

Negotiation. These contacts are established for the purpose of project modification to avoid or lessen an impact on resources. These negotiations typically involve State, Federal, and local agencies. The Project Manager is responsible for determining any project obligations. Negotiation meetings are frequently followed with a letter confirming the final agreements. This process is referred to as consultation when threatened or endangered species are involved. Chapter 4, Endangered Species Act Procedure, discusses this process in detail.

2-4 FIELD SURVEY METHODS

Prior to conducting field surveys, the District Biologist compiles lists of potential sensitive resources likely to occur within the vicinity of the project area. The limits of the project are known and delineated on project plans and/or aerial photos. If possible, the area is surveyed and delineated with survey markers or flagging.

Biological field surveys are conducted to obtain information needed to determine the project's level of impact, long-term and short-term impacts, and the cumulative effects of the project on the biota in the area. Prior to collecting biological data the District Biologist formulates questions and issues that need to be investigated during the field surveys. Pertinent questions include: What is the significance of the impacted resources on a local or regional scale? What is the rarity or abundance of the resource in the region and elsewhere? What is the resilience of the resource? In some cases, where species require a specific survey method protocol or survey permit, it will be necessary to coordinate with resource agencies to obtain approval of the field survey methodology.

The District Biologist walks the project study area to develop an accurate description of the project area, determine the presence of sensitive habitats and species, and evaluate the impacts of the proposed project on the project area. All field surveys to determine the presence of sensitive species are conducted at the appropriate blooming or active period for each resource. A determination of the presence of some sensitive resources may require sampling over more than one season. Some listed species require handling in order to determine their presence in a project vicinity. The District Biologist must obtain the required permits for handling these species or hire a qualified consultant who possesses the required permits.

If the project area is too large to adequately survey, the District Biologist will use aerial photos and maps to investigate the total area. The biologist then conducts meandering transects that traverse the project area, being sure to investigate areas of potential sensitivity found from the data search and aerial photo interpretation.

Field safety is extremely important. It is the responsibility of the District Biologist to become familiar with Caltrans Code of Safe Practices (Appendix 6, Volume 1, Environmental Handbook). As discussed in the Code of Safe Practices, biologists must use the buddy system during surveys.

Survey work that requires entry onto private property is generally allowable under Caltrans Statutes, Article 1, Chapter 4, Title 7 of the Eminent Domain Law. This law states that "any person authorized to acquire property for a particular use by eminent domain may enter upon property to make photographs, studies, surveys, examinations, tests, soundings, borings, samplings, or appraisals, or to engage in similar activities reasonably related to acquisition or use of the property for that use". However, there are limitations to this authority if the activity causes actual damage to or substantial interference with the possession or use of the property. Thus, entry on private property may require that written permission from the property owner or a Right of Entry be obtained. Therefore, it is important that the District Biologist coordinate with the District Right of Way Unit for assistance to determine any actions that might be necessary prior to survey work on private property. Obtaining Rights of Entry, if necessary, could be a time consuming process and it is important that coordination with Right of Way be as far in advance as possible.

2-4.1 Mapping

The District Biologist maps the vegetation types within the survey area as early as possible during field investigations to provide base maps for subsequent biological work and preliminary impact assessment. Mapping should be at a scale large enough to show vegetation types and important biological features such as habitat for sensitive species, wetlands, and unique plant assemblages. Vegetation community map units must be selected on the basis of a recognized classification system. In all cases, the NES must reference the source for all classification systems used.

District Biologists should use a combination of aerial photo interpretation and ground truthing to delineate vegetation types. Descriptive information for each mapping unit includes the distribution of the unit within the study area, an estimate of total acreage, the dominant plant species, and the relative sensitivity of the vegetation type. All plant and animal taxa encountered during site visits should be listed by vegetation type in an appendix to the NES. Identify each species observed to the extent necessary to determine whether it is threatened or endangered. Also identify natural communities whose status is being tracked by the CNDDB.

There may be times when it is appropriate for a biologist to do more than map and calculate the area of the vegetation communities in a project area. A biologist may need to develop a detailed discussion of communities in the project area when communities of state or local significance, such as oak woodlands or wetlands, will be impacted. Information on the degree of canopy cover, tree density, species frequency, and functions and values of specific habitats may be necessary in order to evaluate and develop mitigation. Collecting a greater level of detail will assist the biologist in developing mitigation that appropriately offsets the project impacts. By discussing impacts to these vegetation communities in greater detail within the NES, any associated mitigation costs or project scheduling adjustments can be included in the early planning stages of the project. Investigation of specific habitat or community characteristics will help ensure that proposed mitigation matches project impacts.

2-4.2 Waterways, Wetlands, and Jurisdictional Areas

Caltrans biologists identify, delineate, and discuss impacts to riparian and aquatic communities, including rivers, streams, lakes, wetlands, and other waters of the United States to satisfy the requirements of Executive Order 11990, Section 10, of the Rivers and Harbors Act (33 U.S.C. 401 et seq.), Section 404 and Section 401 of the Clean Water Act (33 U.S.C. 1251-1376), National Wild and Scenic Rivers Act (16 U.S.C. 1271-1287), NEPA, the California Environmental Quality Act (CEQA), Sections 1601-1603 of the Fish and Game Code, and the California Wild and Scenic Rivers Act (P.R.C.5093.50 et seq).

Streams, Rivers, and Lakes. Caltrans is required to notify DFG prior to any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake under Sections 1601-1603 of the Fish and Game Code. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource may be adversely affected, DFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement (e.g. 1601 agreement). The District Biologist must identify in the NES those areas that may pertain to Section 1601-1603 of the Fish and Game Code.

Wetlands and Other Waters of the United States. As discussed in greater detail in Chapter 3, Wetlands, to determine the presence of a wetland the District Biologist uses the U.S. Army Corps of Engineers (ACOE) and U.S. Environmental Protection Agency (EPA) joint definition: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas.

A District Biologist will use the procedures described in the ACOE Wetlands Delineation Manual (January 1987) to make the wetland determination. The wetland determination requires the identification of three

criteria: (1) the presence of wetland hydrology; (2) hydric soils; and (3) a prevalence of hydrophytic vegetation. An in-depth discussion of wetland identification and report format is included in Chapter 3, Wetlands.

When wetlands occur in the project area, the NES will include a Wetland Assessment. The purpose of an assessment is to map the wetland area and discuss the functions, values, and potential impacts on wetlands. For most projects, the discussion of wetland issues is included entirely within the NES. In cases where the discussion of wetland issues is lengthy and/or project impacts are significant, a separate Wetland Assessment will be prepared, summarized within the NES, and included in the NES as a technical appendix.

Federally funded projects must abide by Federal Executive Order 11990, - Protection of Wetlands (May 24, 1977), which directs "all Federal agencies to refrain from assisting in or giving financial support to projects which encroach upon public or private wetlands unless the agency determines there are no practicable alternatives to such construction and that the proposed action includes all practicable measures to minimize harm." In accordance with Executive Order 11990, Federally funded projects must provide an opportunity for early public involvement for all actions involving wetlands. For Categorical Exclusions (CE), a newspaper notice inviting comments must be published. For actions requiring a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS), notices for a public hearing and notices of availability must indicate whether alternatives are located in wetlands. A Wetlands Finding is necessary for actions requiring a FONSI or EIS. Federal Highway Technical Advisory T 6640.8A (October 30, 1987) provides guidance for addressing wetland impacts. Guidelines for compliance with these requirements are discussed in Chapter 3, Wetlands.

2-4.3 Plant Survey Techniques

The following recommendations for botanical surveys and impact assessments have been adopted by DFG and the California Native Plant Society. These guidelines, developed by James R. Nelson, are published in *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California*. It is recommended that Caltrans biologists follow these guidelines.

Guidelines for Assessing Effects of Proposed Developments on Rare Plants and Plant Communities

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how field surveys should be conducted, and what information should be contained in the survey report.

Survey Guidelines.

1. Botanical surveys that are conducted to determine the environmental effects of a proposed development should be directed to all rare, threatened, and endangered plants, and rare plant communities. The plants are not necessarily limited to those species which have been "listed" by State and Federal agencies but should include any species that, based on all available data, can be shown to be rare and/or endangered.
2. It is appropriate to conduct a botanical field survey to determine if, or the extent that, rare plants will be affected by a proposed project when: based on an initial biological assessment, it appears that the project may damage potential rare plant habitat; rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking; or no initial biological assessment has been conducted and it is unknown whether or not rare plants or their habitat exist on the site.
3. Botanical consultants should be selected on the basis of possession of the following qualifications (in order of importance):

a. Experience as a botanical field investigator with experience in field sampling design and field methods;

b. Taxonomic experience and a knowledge of plant ecology;

c. Familiarity with the plants of the area, including rare species; and

d. Familiarity with the appropriate State and Federal statutes related to rare plants and plant collecting.

4. Field searches should be conducted in a manner that will locate any rare or endangered species that may be present. Specifically, rare plant surveys should be:

a. Conducted at the proper time of year when rare or endangered species are both "evident" and identifiable. Field surveys should be scheduled to coincide with known flowering periods, and/or during periods of phenological development that are necessary to identify the plant species of concern.

b. Floristic in nature. Every species noted in the field should be identified to the extent necessary to determine whether it is rare or endangered. Predictive surveys, surveys which predict the occurrence of rare species based on the occurrence of habitat or other physical features rather than actual field inspection, should be reserved for ecological studies, not for impact assessment.

c. Conducted in a manner that is consistent with conservation ethics. Collections of rare or suspected rare species (voucher specimens) should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable State and Federal permit regulations. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection.

d. Conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.

e. Well documented. When a rare or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form should be completed and submitted to the Natural Diversity Data Base.

5. Reports of botanical field surveys should be included in or with environmental assessments, EIR's, and EIS's. They should contain the following information:

a. Project description, including a detailed map of the project location and study area.

b. A written description of biological setting, referencing the community nomenclature used, and a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys.

e. Results of survey (including detailed maps).

f. An assessment of potential impacts.

g. Discussion of the importance of rare plant populations with consideration of nearby populations and total species distribution.

h. Recommended mitigation measures to reduce or avoid impacts and monitoring program to measure the success of the mitigation.

i. List of all species identified.

j. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.

k. Name of field investigator(s).

l. References cited, persons contacted, herbaria visited, and disposition of voucher specimens.

2-4.4 Wildlife Survey Techniques

Given the variety and number of wildlife species and types of habitats found in California, it is impossible to present techniques for surveying each species and type of habitat. As mentioned previously, all wildlife surveys are conducted during a species active period, such as nesting or migration. In cases when surveys must be conducted at times that animals are less likely to be observed, a thorough investigation of the animal's potential habitat should be made. Investigations and careful record keeping should report the presence of tracks, scat, nests or dens, trails, or any other indicators that are specific to the animal. The surveys for wildlife must be commensurate with the magnitude of the project and the importance of potential impacts to the expected resource. Specialized surveys are usually reserved for those instances where a sensitive resource is expected in the project area. Surveys for many of the species listed as threatened or endangered must follow a specified protocol established by DFG or FWS and may require a permit.

A California Native Species Field Survey Form should be completed and sent to CNDDB when sensitive species are located.

A sampling of references that describe wildlife survey techniques is presented. However, this is not an exhaustive list. Each biologist must select the methods with which they feel most comfortable.

Brookhout, T. A., editor. 1994. Research and management techniques for wildlife and habitats. The Wildlife Society, Bethesda, MD. 740 pp.

Cooperrider, A. Y., R. J. Boyd, and H. R. Stuart, editors. 1986. Inventory and Monitoring of Wildlife Habitat. U.S. Department of Interior, Bureau of Land Management, Service Center. Denver, CO., 858 pp.

Davis, D. E. 1990. CRC Handbook of Census Methods for Terrestrial Vertebrates. CRC Press. 375 pp.

Hays, R. L., C. Summers, and W. Seitz. 1981. Estimating Wildlife Habitat Variables. FWS Report FWS/OBS-81/47. 111 pp.

Leedy, D. L. and L. W. Adams. 1982. Wildlife Considerations in Planning and Managing Highway Corridors. FHWA Report. FHWA-TS-82-212. 93 pp.

Ralph, C. J., G.R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. Handbook of Field Methods for Monitoring Land Birds. Pacific Southwest Research Station Report. PSW-GTR-144. 41 pp.

2-5 EVALUATING IMPACTS AND SIGNIFICANCE

The District Biologist evaluates the effects of the project on the biotic resources in the project area. This evaluation investigates the direct and indirect effects (as discussed in Section 2-3.2), the long-term and/or short-term impacts, and the cumulative impacts resulting from the project. The NES also discusses the level of impacts to determine the significance of the project impacts to resources.

2-5.1 Cumulative Effect

A cumulative effect is defined in the NEPA Regulations as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Cumulative impacts can result from individually minor yet collectively significant actions taking place over a period of time."

If the District Biologist evaluates the project for endangered species under the Federal Endangered Species Act, a slightly different definition will be used. Cumulative effect is defined in the FWS Regulations for Interagency Cooperation as "those effects of future State or private activities not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

2-5.2 Determining Significance of Effects

The District Biologist must evaluate the project impacts to determine the level of significance of each impact on the biological resources. Impacts are evaluated by assessing the context and intensity. Context and intensity are defined below.

The Council on Environmental Quality (CEQ) Regulations and CEQA Guidelines have similar approaches to determine the significance of impacts. Following are excerpts from those Regulations and Guidelines. See Volume I of the Environmental Handbook for a complete discussion of significance.

CEQ Regulations, 1508.27 SIGNIFICANTLY. "Significantly" as used in NEPA requires considerations of both context and intensity:

(a) Context. The significance of an action must be analyzed in different circumstances, such as society as a whole (human, national), the affected region, the affected interests, and the locality. An impact's level of significance varies with the setting (context) of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short-term and long-term effects are relevant.

(b) Intensity. The intensity of an impact refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

(1) Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on the balance the effect will be beneficial.

(2) The degree to which the proposed action affects public health or safety.

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

(4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

(5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about future consideration.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or breaking it down into small component parts.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

CEQA Guidelines, 15064 Determining Significant Effects.

(b) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.

(d) In evaluating the significance of the environmental effect of a project, the Lead Agency shall consider both primary, or direct, and secondary, or indirect, consequences.

(g) The decision as to whether a project may have one or more significant effects shall be based on information in the record of the Lead Agency.

(1) If the Lead Agency finds there is substantial evidence in the record that the project may have a significant effect on the environment, the Lead Agency shall prepare an EIR. Said another way, if a Lead Agency is presented with a fair argument that a project may have a significant effect on the environment, the Lead Agency shall prepare an EIR even though it may also be presented with other substantial information that the project will not have a significant effect.

(2) If the Lead Agency finds that there is no substantial evidence that the project may have a significant effect on the environment, the Lead Agency shall prepare a Negative Declaration.

(h) In marginal cases where it is not clear whether there is substantial evidence that a project may have a significant effect on the environment, the Lead Agency shall be guided by the following factors:

(1) If there is serious public controversy over the environmental effects of a project, the Lead Agency shall consider the effect or effects subject to the controversy to be significant and shall prepare an EIR. Controversy unrelated to an environmental issue does not require preparation of an EIR.

(2) If there is disagreement between experts over the significance of the effect on the environment, the Lead Agency shall treat the effect as significant and shall prepare an EIR.

CEQA Guidelines, 15065 Mandatory Findings of Significance.

A Lead Agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where any of the following conditions occur:

(a) The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

(b) The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.

(c) The project has possible environmental effects which are individually limited but cumulatively considerable. As used in the subsection, "cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

(d) The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.

CEQA Guidelines, Appendix G - SIGNIFICANT EFFECTS.

A project will normally have a significant effect on the environment if it will:

(c) Substantially affect a rare or endangered species of animal or plant or the habitat of the species;

(d) Interfere substantially with the movement of any resident or migratory fish or wildlife species;

(t) Substantially diminish habitat for fish, wildlife, or plants;

(v) Create a potential public health hazard or involve the use, production or disposal of materials which pose a hazard to people or animal or plant populations in the area affected.

2-6 MITIGATION MEASURES

A brief synopsis of mitigation is discussed in this chapter as it pertains to the NES. A detailed discussion can be found in Chapter 5, Mitigation and Monitoring.

The District Biologist takes the lead in developing and implementing biological mitigation measures for the proposed action. Only mitigation measures approved by Caltrans management in conjunction with the resource agencies requesting the measures will be discussed in the mitigation section of the NES. All approved mitigation measures are included in the environmental documents. Recommendations from consultants concerning mitigation measures and significance will not be in the NES, but are discussed in the Official Memo transmitting the consultant document to the Contract Administrator.

Mitigation development is coordinated with the appropriate resource or regulatory agency (ACOE, FWS, DFG, Coastal Commission, etc.) and all Caltrans programs affected by the proposed measures. Development of the mitigation plan may involve Project Development, Construction, Landscape Architecture, Maintenance, and Hydraulics, in addition to the Environmental Program.

In some cases the District Biologist must produce a Mitigation Plan, separate from the NES, that outlines measures to avoid, reduce, or offset adverse biological effects associated with transportation projects. This plan will inform personnel associated with the project of the agreed upon mitigation measures, the goals and objectives to be achieved, procedures for their implementation, and practicable monitoring techniques.

Mitigation measures as defined in the CEQ Regulations (40 CFR Part 1508.20) shall include:

- **avoiding** the impacts altogether by not taking a certain action or parts of an action;
- **minimizing** impacts by limiting the degree or magnitude of the action and its implementation;
- **rectifying** the impact by repairing, rehabilitating, or restoring the impacted environment;
- **reducing or eliminating** the impact over time by preservation and maintenance operations during the life of the action; and
- **compensating** for the impact by replacing or providing substitute resources or environments.

The level of mitigation required will be a consequence of the significance of the impacts on the biotic resources.

2-7 NATURAL ENVIRONMENT STUDY FORMAT AND CONTENT

The following is a suggested outline to help develop the NES.

I. Summary of Findings and Conclusions

The Summary of Findings and Conclusions includes the results of the impact analysis, findings of the technical reports, and a summary of the general biological studies. The negative and positive impacts, as well as the agreed upon mitigation measures and permits that will be required, are included in this section.

II. Introduction

The Introduction describes the proposed project, its general location and a concise statement of the project's purpose and need.

A. Project Description

B. Project Purpose and Need

III. Study Methodology

The Study Methodology discussion tells the reader what studies were conducted, how they were conducted and when they were conducted.

A. Studies Required (HEP, WET, etc.)

B. Survey Dates and Personnel

C. Problems Encountered and Limitations That May Influence Results (untypical weather, surveying at the wrong time of year, etc.)

D. Definition of terms

IV. Environmental Setting

The Environmental Setting sets up the biological discussion so the reader understands the region in which the project will occur. A clear description of the setting explains the context and intensity of impacts. The setting discussion gives the reader a concise description of the area's topography, soils, vegetation, water courses and level of human or natural disturbance.

A. A description of the biological communities and topographical features encountered in the project area with descriptions of the dominant plant species and common wildlife species.

B. The existing level of disturbance.

V. Important Biological Resources in the Project Area

This section describes the species of special concern that are likely to be in the project area. (This can be presented in a table format).

A. Plant Species of Concern

B. Wildlife Species of Concern

C. Important Natural Communities

VI. In Depth Studies for Special Laws

The NES may include detailed studies if there are biological resources in the project area that receive special attention because of specific laws. Detailed studies include a Biological Assessment and Wetlands Assessment.

VII. Project Impacts

This section analyzes the potential impacts on biotic resources for each project alternative. Each alternative is evaluated to determine its impact to the biological resources in the project area and to what degree mitigation will be required.

VIII. Cumulative Impacts

This section evaluates current and future Caltrans actions, as well as non-Caltrans actions, within the project study area that are currently threatening the biotic resources.

IX. Mitigation Measures

Only mitigation measures approved by Caltrans management in conjunction with the resource agencies are discussed in the NES.

X. Agency Coordination

A paragraph describing completed and ongoing coordination between Caltrans and reviewing agencies.

XI. References and Personal Contacts

All literature, data sources, and personal contacts used to obtain information for the NES are listed. This section also includes the List of Preparers.

XII. Appendix

The appendices include information to back up the NES such as mapping, plant and animal lists, wetland data forms, and CNDDB forms.

CHAPTER 3

WETLANDS

CHAPTER 3

WETLANDS

3-1 INTRODUCTION

This chapter will describe the responsibilities of the District Biologist, the definition of wetlands, how and why wetlands are regulated, and the general procedures that should be implemented by the biologist when dealing with wetland impacts.

3-2 BIOLOGIST'S ROLE

The Caltrans District Biologist acts as the liaison between Caltrans and resource and regulatory agencies, such as the U.S. Army Corps of Engineers (ACOE), that are responsible for approving actions that affect habitats described as wetlands. The District Biologist is responsible for being aware of the regulatory procedures required for identifying wetlands. In addition, the biologist must have a basic understanding of wetland ecology in order to determine the extent of potential impacts and to design appropriate mitigation or compensation activities.

The District Biologist is a member of the Project Development Team (PDT) with varied responsibilities that frequently go beyond the environmental analysis process. With regard to wetlands, the overall processes that involve the biologist are listed below.

- Perform field reviews of the project, as needed, to determine whether wetlands are present.
- Map or delineate the wetlands and other waters of the United States and submit a report to the ACOE and the Natural Resources Conservation Service (NRCS) documenting results and requesting verification of the determination.
- Provide mapping to the Project Manager and discuss methods to avoid, minimize, or mitigate (compensate for) potential impacts to wetlands.
- Coordinate with resource and regulatory agency staff to discuss potential project impacts and methods to avoid, minimize, or mitigate potential impacts to wetlands. Where possible, written agreement is obtained from agency staff regarding proposed methods.
- Confirm implementation of avoidance, minimization, and mitigation activities during and/or prior to construction of the transportation project.
- Where required, monitor or provide monitoring oversight for habitat mitigation activities.
- Report monitoring results to resource and regulatory staff as required.

3-3 WETLANDS DEFINED

Executive Order 11990 - Protection of Wetlands (1977), calls for no net loss of habitats referred to as wetlands. Wetlands are driven by hydrology. The presence of water near the soil surface results in soil and plant characteristics that are not found in uplands (mostly dry) or aquatic (almost always wet) areas. Wetlands are generally found in transition zones between upland and aquatic habitats.

For the regulatory process, the ACOE and U.S. Environmental Protection Agency (EPA) jointly define wetlands as follows: "Those areas that are inundated or saturated by surface or ground water at a frequency

and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (EPA, 40 CFR 230.3 and ACOE, 33 CFR 328.3).

Caltrans recognizes this definition and uses it in the assessment of biological impacts of transportation projects. The EPA, ACOE, U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game (DFG) work together in reviewing and approving the permits most frequently required for projects which will impact wetlands. The Regional Water Quality Control Board (RWQCB) may also have a role in its capacity of providing Section 401 certification.

The following wetland types are commonly found in California:

Freshwater. These areas may be permanent or seasonal, inland or coastal. This category includes riparian, or streamside areas, marshes, seeps, montane mountain meadows, and vernal pools. In some cases, wetlands may also occur within riparian settings above the wettest portions of the streambed. Areas subject to saltwater influence in coastal settings support vegetation adapted to brackish conditions. Alkaline conditions may support vegetation similar to that found in areas influenced by saltwater.

Saltwater. Coastal marsh, subject to full tidal action, occurs along the coast of California.

3-4 REGULATORY AGENCIES

The term "regulatory agency" is typically used to describe agencies such as the ACOE and the DFG which issue wetland related permits or agreements.

The following table provides a summary list of the agencies that regulate activities in wetlands (Cylinder *et al*. 1995).

Agency	Regulation	Authority
U.S. Army Corps of Engineers	Clean Water Act, Section 404	Regulates placement of dredged or fill material into waters of the United States.
	Rivers and Harbors Act of 1899 Section 10	Regulates work in navigable waters of the United States.
U.S. Environmental Protection Agency	Clean Water Act	Enforcement of regulations, may veto ACOE permit.
	CEQA, NEPA	Commenting authority.
U.S. Fish and Wildlife Service	Fish and Wildlife Coordination Act	Reviews/comments on Federal actions that affect wetlands and other waters, including Section 404 permit applications.
	Endangered Species Act	ACOE must consult with FWS if endangered species on site.
	CEQA, NEPA	Commenting authority.

National Marine Fisheries Service	Fish and Wildlife Coordination Act	Reviews/comments on Federal actions that affect coastal waters, including Section 404 permit applications.
	Endangered Species Act	ACOE must consult with NMFS if endangered marine species on site.
	CEQA, NEPA	Commenting authority.
California Department of Fish and Game	California Fish and Game Code Sections 1600-1607	Regulates activities resulting in alteration of streams and lakes.
	CEQA, NEPA	Commenting authority.
Regional Water Quality Control Boards	Clean Water Act, Section 401	Issues water quality certification; certification required for Section 404 permits.
	Clean Water Act, Section 401	Regulates discharge of waste into waters of the United States.
	CEQA, NEPA	Commenting authority.
California Coastal Commission	Coastal Act of 1976	Issues all coastal development permits.
	Coastal Zone Management Act of 1976	Issues notice that work is consistent with state coastal management plan.
	CEQA, NEPA	Commenting authority.
San Francisco Bay Conservation and Development Commission	McAteer-Petris Act of 1965	Regulates work within the bay, certain creeks, and a shoreline band of 100 feet inland from line of highest tidal action.
State Lands Commission	Public Trust Doctrine	May preclude the use of submerged lands and tidelands if this use is inconsistent with public trust.

3-4.1 U.S. Army Corps of Engineers

Wetlands have legal protection in accordance with Section 404 of the Clean Water Act (33 U.S.C. Section 1344). A permit from the ACOE is required for most activities that will impact wetlands.
The term "waters of the U.S." is also discussed in Section 404. Waters are currently described as any areas that might be considered waterways, either for commerce or recreation, even on a limited scale. Wetlands are a subcategory of waters. Frequently, the term "wetlands and other waters of the U.S." is used when describing areas under ACOE jurisdiction. Delineation of waters and wetlands results in "potential jurisdictional areas" which must be verified by the ACOE. Upon verification, these areas are referred to as "jurisdictional areas." Litigation may result in modification of the definition of waters and/or wetlands; therefore, the District Biologist or other user of this handbook must use the latest guidance from the ACOE.

A Section 404 permit is required from the ACOE when a project requires fill or other modification of waters, including wetlands. There are two types of permits issued by the ACOE, individual and general.

Individual Permits. Individual permits are the most complex. They cover projects affecting more than three acres, resulting in potentially significant impacts. The process of obtaining an individual permit usually takes many months. Special Conditions of the permit may include mitigation activities that need to be monitored for a five to ten year period for the most complex and/or controversial projects.

General Permits. There are two types of general permits, nationwide and regional. Nationwide permits cover a wide variety of activities with minimal impacts (less than three acres, 500 feet of lineal stream). Nationwide permits may take two to three months, or more, to obtain. Regional permits are wide ranging, blanket permits used to cover roadside ditch maintenance activities, for example, for a designated geographic area. Regional permits may take months to prepare; however, they save time in the long run for small activities such as routine maintenance.

Initiation of a request for an ACOE permit to affect wetlands involves other resource and regulatory agencies as a part of the interagency review process. The ACOE submits permit applications to the EPA, DFG, National Marine Fisheries Service (NMFS), and FWS for review and comment. Time periods and extent of commenting required by these agencies varies depending upon the permit type. Individual permits are the most lengthy and involved.

Applications for ACOE permits may be prepared and submitted by the Project Engineer, the District Biologist, or others, using information on delineated wetlands and other waters of the U.S. as prepared by the biologist. The Project Engineer provides information on the extent of the construction impacts responsible for proposed fill. The District Biologist is the key liaison with resource and regulatory agency staff regarding the wetland habitat impacts and potential mitigation.

3-4.2 Regional Water Quality Control Board

Section 401 of the Clean Water Act (33 U.S.C. 1341) requires any applicant for a Federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain certification from the State in which the discharge originates. As a result, proposed fill in waters and wetlands requires coordination with the appropriate RWQCB that administers Section 401 and provides certification. The RWQCB also plays a role in review of water quality and wetland issues, including avoidance and minimization of impacts. Section 401 certification is required prior to issuance of a Section 404 permit. The Project Engineer may be responsible for this coordination, with assistance from the District Biologist, regarding specific impacts and mitigation.

3-4.3 California Department of Fish and Game

Wetlands may also be subject to jurisdiction of the DFG in accordance with DFG Code Sections 1600-1607. The DFG regulates activities that would alter the flow, bed, channel or bank of streams and lakes by issuing Streambed Alteration Agreements, a type of permit. In riparian areas their jurisdictional limits are usually delimited by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the DFG.

Caltrans must contact the DFG regarding any potential Section 1600-1607 impacts independent of their role as reviewer on ACOE Section 404 permits. The DFG contacts for Section 1600 are best facilitated by coordination with the District Biologist.

3-4.4 California Coastal Commission

When a project will require fill in wetlands within the coastal zone, Caltrans must obtain a permit from the California Coastal Commission (CCC) or the city or county with coastal permit jurisdiction. The CCC oversees implementation of the California Coastal Act (CCA) and the Federal Coastal Zone Management Act (CZMA). The coastal zone is generally defined as the distance from the ocean shoreline 1,000 yards inland, or more in some locations. The District Biologist and the Project Engineer may share coordination with the CCC, when needed.

3-4.5 San Francisco Bay Conservation and Development Commission

Projects affecting wetlands within the limits of San Francisco Bay may require a permit from the San Francisco Bay Conservation and Development Commission (BCDC). The BCDC has jurisdiction over all areas of San Francisco Bay subject to tidal action up to the mean high tide line, or a line five feet above mean sea level in marshlands. The area 100 feet inland from the mean high tide is also within jurisdiction. The BCDC is responsible for Federal implementation of the CZMA within the limits of San Francisco Bay, rather than the CCC. The Project Engineer is usually the key contact for this agency. The District Biologist provides analysis of wetland impacts and may work directly with agency staff on mitigation requirements unique to the BCDC.

3-4.6 State Lands Commission

The State Lands Commission (SLC) manages submerged lands, tidelands, and swamp and overflowed lands owned by the State. Despite the fact that most of these lands have been conveyed to the private sector, submerged lands and tidelands are still subject to the public trust, even if filled. Permits from the SLC or land use leases with conditions to protect the purposes of the public trust may be required.

3-5 RESOURCE AGENCIES

The term "resource agency" is typically used to describe agencies such as the FWS, NMFS, and the EPA, which protect natural resources but do not issue wetland-related permits.

3-5.1 U.S. Environmental Protection Agency

The mission of the EPA includes protection of human health and safeguarding the natural environment. The EPA has the right to challenge an ACOE permit approval. Section 404 (b) (1) of the EPA and ACOE guidelines for Section 404 of the Clean Water Act (ACOE, EPA 1993) involve assurance that the proposed activity does not violate water quality standards. It requires that the applicant provide an alternatives analysis to show that the alternative least damaging to waters of the United States has been selected.

3-5.2 Natural Resources Conservation Service

Caltrans may be required to coordinate with the NRCS, formerly the Soil Conservation Service, when a proposed transportation project may affect agricultural lands where farmers have been growing commodity crops in areas that were drained, filled, or otherwise altered wetlands prior to 1985. The Food Security Act of 1985 (referred to as "Swampbuster") ended the NRCS approval of the draining of wetlands for commodity crops. The NRCS administers the Act, as amended by the Food, Agriculture, Conservation, and Trade Act of 1990 and the Federal Agriculture Improvement and Reform Act of 1996.

In 1994, the NRCS signed a Memorandum of Agreement (MOA) with the ACOE which makes the NRCS responsible for wetland delineations on prior converted croplands and farmed wetlands that receive

agricultural subsidies through the Federal government. Agricultural land is defined as land that is intensively used and managed for the production of food and fiber. Examples are cropland, hayland, and pastures, including native pastures and rangeland, orchards, vineyards, areas which support wetland crops, other lands used to produce or support the production of livestock, and small tree farms. The NRCS may use the procedures for delineating wetlands as described in the National Food Security Act Manual, Third Edition (NRCS 1996). Linear projects such as roadway improvements may be excluded from the NRCS involvement.

When the NRCS is involved, the District Biologist is responsible for contacting the NRCS, submitting the wetland delineation report to the appropriate NRCS field office, and requesting verification. In some cases, the ACOE may take the responsibility for the NRCS verification, or provide evaluation of an "other waters" determination. It is best to obtain guidance from the NRCS regarding responsibility of all aspects of the determination.

3-5.3 U.S. Fish and Wildlife Service

The mission of the FWS includes working to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. According to the Fish and Wildlife Coordination Act, all Federal agencies are required to contact the FWS, NMFS, and the state's wildlife agency regarding activities that affect, control, or modify waters of any stream or other bodies of water. The DFG is the state wildlife agency in California. These consulted agencies review applications for permits issued under Section 404 and provide comments to the ACOE about the environmental impacts of the proposed project.

3-6 EARLY COORDINATION AND AGREEMENTS

3-6.1 Early Coordination

It is important to identify potential wetland impacts as early in the environmental process as possible. Early notification to the Project Manager allows time for investigation of design modifications to avoid or minimize potential impacts to wetlands. If impacts cannot be avoided, and have been reduced to the minimum level practicable, wetland mitigation proposals to compensate for those impacts must be developed by the District Biologist and others on the Project Development Team, and evaluated as part of the environmental impact analysis process.

3-6.2 NEPA/404 Memorandum of Understanding

Caltrans has implemented early coordination with the State and Federal agencies involved in the wetland regulation process. In 1993, Caltrans signed a Memorandum of Understanding (MOU) with the Federal Highway Administration, Federal Transit Administration, EPA, ACOE, FWS, NMFS, and the Arizona and Nevada Departments of Transportation. The objective of the MOU is to integrate the National Environmental Policy Act (NEPA) and the Clean Water Act, Section 404. Referred to as the NEPA/404 integration process, the MOU commits these agencies to ensuring the earliest possible consideration of environmental concerns pertaining to waters of the U.S., including wetlands.

Early stage planning meetings allow for full discussion of project alternatives to avoid wetlands. These alternatives may need to be discussed in the environmental document as a Wetlands Only Practicable Finding (WOPAF). Section 404 permit applications also require an alternatives analysis.

3-7 WETLAND DELINEATION

As stated in Section 3-3, Caltrans follows the wetlands definition agreed to by the EPA and ACOE. Although the DFG and FWS have their own definitions, they rarely play a role in the wetland delineation and assessment process.

The ACOE publishes guidance regarding the standard procedures required to delineate wetlands that may be under ACOE jurisdiction (Env. Lab. 1987). In 1994, the EPA, NRCS, and ACOE agreed to use the 1987 ACOE Wetland Delineation Manual for non-agricultural lands (CFR Vol. 59, No. 12, pp. 2920-2924 Jan. 19, 1994). The procedure describes a three-parameter approach that includes presence of hydrophytic vegetation, wetland hydrology, and hydric soils. All three parameters must be present, under normal circumstances, for an area to be designated as a wetland under jurisdiction of the ACOE. Such wetlands are referred to as jurisdictional wetlands. In order to obtain a Section 404 permit, Caltrans must provide the ACOE with a delineation of potential jurisdictional areas, including wetlands.

The delineation must be made by a qualified biologist. A qualified biologist is one who has successfully completed an ACOE approved training course in wetland delineation in accordance with the currently approved methodology. Biologists who have not completed the training should be supervised by a qualified biologist when preparing wetland delineations. The biologist takes site information and background materials to prepare what is commonly referred to as a Wetland Delineation Report. For clarification of the fact that this report covers wetlands and other waters of the U.S., it might more accurately be referred to as the Wetlands/Waters Delineation and Assessment Report.

This report is submitted to the ACOE as a part of the Section 404 permit application package. It also serves as a technical report for the environmental document, in conjunction with the Natural Environment Study (NES) described in Chapter 2 of this handbook. If the wetland impacts of a project are very small, their discussion may be included as a part of the NES. In this case, a separate Wetland Delineation Report would be prepared and submitted to the ACOE for the permitting process. Materials to include in these reports will be discussed in the following section. If the wetland impacts are large or controversial, it is more convenient to prepare a report separate from the NES. The NES covers non-wetland impacts that would not necessarily be of interest to the ACOE in review of a Section 404 permit application.

3-8 WETLANDS ASSESSMENT

Delineation of wetlands is only the first phase of determining potential impacts. The biologist must also analyze the impacts with respect to the proposed loss of wetland functions and values. Proposed mitigation or compensation actions must also be developed. In order to do this, the functions and values of the wetland habitat must be evaluated to determine the degree of impacts resulting from the proposed transportation project. In this manner, appropriate mitigation plans may be developed to replace those functions and values.

Functions. Functions are the physical, chemical, and biological attributes of a wetland without regard to their importance to society. Examples of functions include flood flow alteration, wildlife habitat, and groundwater discharge.

Values. The term values may be used to describe those functions that are generally regarded as beneficial to society. Recreation and uniqueness are examples of values. All or part of society may not value some functions. Nutrient removal and transformation, for example, may not be considered a value if that function leads to algal blooms and noxious odors.

Caltrans uses the functions and values described in the Wetland Evaluation Technique (WET) (Adamus *et al*. 1987). The WET manual describes the following functions and values:

- Groundwater recharge

- Groundwater discharge
- Flood flow alteration
- Sedimentation stabilization
- Sediment/toxicant retention
- Nutrient removal/transformation
- Production export
- Wildlife habitat (aquatic and terrestrial)
- Uniqueness/heritage
- Recreation

The WET Manual describes a detailed methodology for analyzing these functions and values. The results describe habitat values as low, medium, or high, without regard to habitat size. The model is based primarily on wetland systems from the southern and eastern regions of the United States.

Although the complex methodology described in the manual may be used, experience has shown that informed professional judgment, applied to the identified functions and values, accomplishes the same result in California wetlands. These results are obtained in significantly less time than implementing the full methodology. The District Biologist is responsible for interpreting and understanding the functions and values and using their best professional judgement to determine potential impacts.

3-9 WETLAND DELINEATION AND ASSESSMENT REPORT FORMAT

The following outline represents one way to present the project information in a report format. This outline may be adapted to meet the needs of a particular project.

I. Summary

II. Introduction

A. Description of Project

B. Purpose of Assessment

III. Project Setting

A. Vegetation community

B. Hydrology

C. Soils

IV. Methodology

A. Pre-survey investigations

B. Field survey

V. Results

A. Summary table of wetland impacts

B. Wetland functions and values

1. Description of existing functions and values
2. Potential impacts

VI. Discussion

A. Avoidance and minimization recommendations

B. Mitigation recommendations

VII. References Cited

VIII. Personal Communications Cited

IX. Appendices

A. Project maps showing proposed ACOE jurisdictional areas (1:100 scale map preferred)

B. Data Forms - Wetland Delineation

C. National Wetlands Inventory (NWI) map, where available

3-10 WETLAND MITIGATION

In accordance with Section 404 requirements, Executive Order 11990 - Protection of Wetlands (1977), and the U.S. Fish and Wildlife Service Mitigation Policy (1981) unavoidable impacts to wetlands must be compensated. The District Biologist works closely with the Project Development Team to design a suitable creation or restoration project that will replace the wetland functions and values affected by the transportation project. The District Biologist is usually responsible for monitoring the wetland mitigation report and submitting annual monitoring reports to the ACOE. The processes involved are described in detail in Chapter 5, Mitigation and Monitoring.

3-11 REFERENCES

ACOE, EPA, 1993. Federal Register Vol. 58, No. 163, August 25, 1993, pp. 45008-45038. Dept. of Defense, Dept. of the Army, Corps of Engineers, 33 CFR Parts 323 and 328; Environmental Protection Agency, 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, and 401, Clean Water Act Regulatory Programs.

Adamus, P.R., E.J. Clairain, Jr., , R.D. Smith, and R.E. Young. 1987. Wetland Evaluation Technique (WET): Volume II: Methodology, Operational Draft Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Cylinder, P.D., D.M. Bogdan, E.M. Davis, and A.I. Herson. 1995. Wetlands regulation - a complete guide to federal and California programs. Solano Press Books, Point Arena, CA. 363 pp.

Environmental Laboratory, 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss.

Natural Resources Conservation Service, 1996. National Food Security Act Manual, 3rd Edition. 180-V-NFSAM.

U.S. Fish and Wildlife Service, 1981. U.S. Fish and Wildlife Service Mitigation Policy. Federal Register Vol. 46, No. 15, January 23, 1981, pp. 7644-7663 (as corrected in the Federal Register of February 4, 1981).

CHAPTER 4

ENDANGERED SPECIES ACT PROCEDURE

CHAPTER 4

ENDANGERED SPECIES ACT PROCEDURE

4-1 INTRODUCTION

All projects must be evaluated to determine if any endangered or threatened species may be affected. The Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA) are the Federal and State laws to enforce protection of threatened and endangered species. This chapter is a summation of the laws, documentation, and processing requirements of those laws.

The purpose of the procedure is to determine whether a project will actually involve proposed or listed species or critical habitat at the earliest possible time in the project development process. If proposed or listed species or critical habitat are present, there will be time to modify the project to avoid or minimize impacts. If proposed or listed species or critical habitat are not present, then no further formal involvement with the Endangered Species Act procedure is required. Further discussions may be held for other special status species impacted by the project.

4-1.1 Federal Endangered Species Act of 1973

The purpose of this law is to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved and to provide a program for the conservation of such endangered and threatened species. Section 7 of this Act outlines the responsibilities of Federal agencies in protecting endangered and threatened species. It states: "...each Federal agency shall, in consultation with, and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical...".

Section 7 has been amended several times since being signed into law in 1973. The latest requirements for consultation can be found at 50 CFR Part 402. This establishes the procedural regulations governing interagency cooperation.

4-1.2 California Endangered Species Act

The CESA became effective on January 1, 1985 to provide a means to conserve, protect, restore, and enhance any endangered or threatened species and its habitat. Unlike FESA, there are no state agency consultation procedures under CESA. For projects that affect both a state and federal listed species, compliance with the Federal Endangered Species Act (FESA) will satisfy CESA if the Department of Fish and Game (DFG) determines that the federal incidental take authorization is "consistent" with CESA under F&G Code Section 2080.1. For projects that will result in a take of a state only listed species, Caltrans must apply for a take permit under Section 2081(b).

4-2 FEDERAL PROCESS

4-2.1 Determining the Need for a Biological Assessment

The evaluation procedure for endangered and threatened species parallels the project development process. This procedure is designed to develop the listed species information required for the preparation of the environmental document.

If listed species may be involved a Biological Assessment must be prepared. The U.S. Fish and Wildlife Service (FWS) defines Biological Assessment as "...the information prepared by or under the direction of the Federal agency concerning listed and proposed species and designated and proposed critical habitat that may be present in the action area and the evaluation of the potential effects of the action on such species and habitat". Caltrans has expanded this definition to also include those species listed by the California Department of Fish and Game (DFG).

The following sections are presented as a guide. The circumstances of each project will determine if, and when, a given task will actually be performed.

Evaluate Project Proposal

The preliminary evaluation should be performed early in the project development process so it can be used in the selection of alternatives to be studied in the environmental document.

Once the list of potential alternatives is established, a library search and check of the California Natural Diversity Data Base (CNDDB) can be completed. When a list of resources that have the potential of occurring in the project vicinity is established, a windshield survey or walk through of the project can be completed. During the site visit the existing habitats should be roughly drawn on a base map. With a list of species potentially in the project area and a map of the existing habitats, a comparative estimate of endangered species involvement can be made for each alternative.

Determine If Species List Request Is Required

The purpose of requesting a list from FWS is to assure that the Biological Assessment addresses all listed, proposed, and candidate species that FWS believes may be in the project area. The District Biologist determines whether a list request is required from FWS. The list request should normally be initiated no later that the Notice of Intent/Notice of Preparation stage of the environmental document procedure. Circumstances under which a request is made depends upon the type of environmental document and potential for impacts.

> **Environmental Impact Statement (EIS).** Caltrans is required to request a list when an EIS will be prepared. The list should be requested at the earliest time the District believes an EIS will be prepared for a project and the resources are available to perform the necessary surveys (appropriate time of year, surveyors available, project defined, etc.).
>
> **Categorical Exclusion (CE) and Finding of No Significant Impact (FONSI).** A list is requested when it is suspected that the project will affect a Federally listed or proposed species. In this way, the required study to determine a project's impact on Federally listed and proposed species will cover all the species monitored by FWS. Therefore, if a consultation/conference is required, the District will not have to retrace the process to perform a study on a species they may have overlooked.

A request for a list is not required if a project will only affect a special status species other than a listed or proposed species. However, if the District prefers to request a list, it may do so. As a matter of practice, this type of request should be kept to a minimum to avoid unnecessary work.

FWS List Request

Request the list at the proper time of year to complete field studies for suspected special status species. FWS has 30 days to respond to list requests. Studies not started within 90 days of list receipt should have a new list request or verification that the original list is still valid. Studies should be completed within 180 days of the list request. Surveys for many species can only be done during very specific periods of the year so the timing of list requests is very important.

The district initiates the list request with a written request to the Field Office of FWS that has responsibility for the county in which the project is located. A list request from the National Marine Fisheries Service (NMFS) will only include species under their jurisdiction.

If the response from FWS is that no special status species are present, there will be no further involvement with Section 7. However, if the response from FWS is that special status species are or may be present, proceed to **Complete Field Studies**.

Complete Field Studies

Once aware that special status species are or may be present in the project area, the District must initiate a biological study to determine any effects that the proposed project may have on the species. The initial effort is determining the actual presence or absence of a species in the area of impact. If identified as being present in the area, the project's effect on the species must be determined. The level of study must be sufficient to determine the type and extent of the effects a project will have on a special status species.

4-2.2 Preparation of the Biological Assessment

Once the field study is complete, a Biological Assessment must be prepared which clearly states what the probable impact will be from constructing the project as proposed. If the conclusion is that the project may affect special status species or critical habitat, the Biological Assessment should be prepared as a working draft. If there are no impacts to special status species or critical habitat, the document should be in a final form for later processing.

A Biological Assessment is required when an EIS is being prepared and FWS has included a listed or proposed species in the list request. As a matter of practice, a report should also be prepared whenever the District Biologist determines that the project may affect a listed or proposed species or listed or proposed critical habitat, regardless of document type.

While the Biological Assessment is in draft form, the Project Manager and District Biologist should meet with representatives of the Federal Highway Administration (FHWA), FWS/NMFS, and DFG to explore methods of reducing project impacts. This includes evaluating methods of avoiding the impact, minimizing the impact or developing appropriate mitigation to off-set project impacts, in that order. After all participants are satisfied, a final Biological Assessment is prepared.

Regardless of whether or not a list is requested, if studies show a project will affect a special status species (other than listed or proposed) discussions with FWS/NMFS or DFG should occur as appropriate. The goal is to eliminate impacts or minimize them as much as possible. Species may be listed before the project is actually constructed. If this is a distinct possibility, then the additional work may avert problems during project construction. This decision is a judgment call. Committing the same resources for special status species that would be committed for listed species is not always possible.

4-2.3 Biological Assessment Report Format

The following is a suggested outline to help develop the Biological Assessment.

I. Summary of Findings and Conclusions

II. Introduction

A. Project Description

B. Studies Required to Satisfy Endangered Species Laws

III. Special Status Species

The focus of this section is a table listing each sensitive status species resulting from your search. At a minimum, the table should briefly show: 1) Species Name, 2) Species Status, and 3) Habitat Requirements. The species list should be developed through information gathered from the FWS lists, results of the CNDDB Rarefind data base search, literature review, and consultation with experts for specific species.

IV. Study Methodology

A. Details of What Was Done to Determine Impacts

B. Problems Encountered or Limitations That May Influence Results

C. Survey Dates and Survey Personnel

V. Environmental Setting

Describe the overall description of the plant communities in the project area. Include the dominant plants in each plant community. The complete list of plants and animals encountered will be included in the Appendix.

VI. Results

For each special status species provide the following information:

A. Species Background and Requirements (a detailed description)

B. Historical Occurrence in Project Vicinity

C. Species Presence in Project Impact Area

D. Potential Effects (effects of each project alternative on species and/or habitats, including cumulative effects)

VII. Mitigation

Discuss only approved mitigation measures. In most cases, mitigation measures are determined during informal consultation, in which case they should be part of the Biological Assessment.

VIII. References and Personal Contacts

All literature, data sources, and personal contacts used to obtain information for the Biological Assessment are listed. This section also includes the List of Preparers.

IX. Appendix

The appendices may include completed CNDDB survey forms for all special status species encountered, the location of voucher specimens, photographs, exhibits, etc.

4-2.4 Processing of the Biological Assessment

Processing the Biological Assessment depends on the environmental document type and the species status.

If the determination is:	**Then:**
EIS	**FWS/NMFS**
Listed species, may affect;	Consultation.
Listed species, not likely to adversely affect or no effect;	Concurrence in finding.
Proposed species, may jeopardize;	Conference.
Proposed species, not likely to adversely affect or no effect;	Concurrence after listed.
Candidate/species of concern, may affect;	Technical Assistance.
Candidate/species of concern, no effect;	Summarize in document, backup in file.
CE /FONSI	**FWS/NMFS**
Listed or proposed species, no effect. *	Summarize in document, backup in file.
If list was requested from FWS, no effect.	Notify FWS of no effect to close file.
All others.	Same as EIS.

* It is the Caltrans biologist's responsibility, with FHWA concurrence, to make the determination of "may affect" for a project which would trigger the requirement to consult with FWS/NMFS. Caltrans/FHWA also assumes the risk of making an erroneous decision.

Multiple requests from the same agency on a single project will be handled under a single letter of request. Consultation, conference, and concurrence are the only formal processes that require a written request. All others are informal and may be handled by phone, mail, or electronically.

Formal Consultation, 50 CFR Part 402.14

As with all formal FESA processes, the Caltrans District Biologist prepares the package that FHWA will use to make the request to FWS/NMFS. It is transmitted by letter to FHWA with a request that they initiate consultation. As the Federal agency, FHWA is required to initiate consultation when a project with Federal participation has the potential to affect a Federally listed species and/or destroy or adversely modify designated critical habitat. Formal consultation is held between a Federal agency and FWS/NMFS. Consultation is initiated through a written request from FHWA to FWS/NMFS and includes the Biological Assessment for the project and any other relevant reports or studies with information on the action, the affected listed species, or critical habitat.

The consultation is initiated when the project has been defined and the Biological Assessment completed. Consultation concludes within 90 days, at which time FWS/NMFS has 45 days to complete the Biological Opinion. If there is any potential that a listed species could be taken as the result of the project, a statement

authorizing this take is included in the Biological Opinion. There are basically three potential outcomes from consultation:

1. Action will promote the conservation of listed species.
2. Action is not likely to jeopardize the continued existence of a listed species and is not likely to destroy or modify designated critical habitat.
3. Action is likely to jeopardize the continued existence of a listed species and/or is likely to destroy or modify designated critical habitat.

Conference, 50 CFR Part 402.10

FHWA is required to initiate a conference when a project with Federal participation has the potential to jeopardize a Federally proposed species and/or destroy or modify proposed critical habitat. A conference is held between a Federal agency and FWS/NMFS. A conference is initiated through a written request from FHWA to FWS/NMFS and includes the Biological Assessment for the project and any other relevant reports or studies with information on the action, the affected proposed species or proposed critical habitat.

The written request should include a request that the conference be conducted in accordance with the procedures for formal consultation. This way, if the species becomes listed, FWS/NMFS could accept the conference opinion as the Biological Opinion without interrupting the project. This is not automatic. The FWS/NMFS will have to be contacted with a request that they accept their conference opinion as their Biological Opinion. The potential outcomes from a conference are the same as those from a consultation but are only advisory until the species is actually listed.

Informal Consultation, 50 CFR Part 402.13

All correspondence between the FWS/NMFS and FHWA or their delegate, including a request for a list of species, is considered informal consultation. All formal negotiations should be preceded by informal consultation. Resolution of conflicts between a project and special status species during this process could eliminate the need to enter a formal process. If complete agreement can be reached during this process and a formal process is still required, it can be accomplished in a minimum of time.

During informal consultation, if any impacts to listed species can be reduced to the point of "not likely to adversely affect," the District should seek the written concurrence of FWS/NMFS. The Biological Assessment is submitted to FWS/NMFS by FHWA with the request for concurrence in the findings. This is done in accordance with 50 CFR Part 402.12 (j) and (k). The FWS/NMFS should respond in 30 days from the date that they receive the request. In those instances where the list provided by FWS/NMFS includes several listed species each will require closure. For those species that a "not likely to adversely affect" conclusion can be reached, a request for concurrence in that finding will be required. For those species where a "may affect" still exists, a request for consultation will be required. Both requests should be handled in a single letter. Don't assume that FWS/NMFS will automatically include their concurrence for other species when they write their Biological Opinion for the species on which consultation was required.

Technical Assistance

Technical assistance refers to informal discussions between Caltrans and resource agencies for the purpose of removing or reducing impacts to special status species that are neither listed nor proposed for listing. There are several classifications of species that are considered special status (candidates and species of concern at the Federal level and species of special concern at the State level) and should be considered during the Biological Assessment. While these species do not receive protection under either of the endangered species laws, they could be listed at any time. If any of these species are listed before

construction is completed and there is a potential for impact, work would have to be suspended while consultation is completed. The closer the agreement concerning impacts and mitigation during the early stages of project development, the shorter the work stoppage for consultation. Technical assistance is informal; however, it should be taken as seriously as if the species were listed. FWS/NMFS technical assistance also includes recommendations for studies, persons to contact, etc. for listed species.

4-2.5 Programmatic Biological Assessments

Similar projects with recurring minor impacts to the same species are candidates for a programmatic consultation with FWS/NMFS. FWS/NMFS and Caltrans/FHWA agree to the type and magnitude of project impacts that will be allowed under the programmatic. A Programmatic Biological Assessment is completed that outlines what types of impacts would occur and what would be required to offset those impacts. Once the Programmatic Biological Opinion is issued and a project meeting the conditions of the programmatic is proposed, the District completes a project specific Biological Assessment. If FWS/NMFS concurs with the conditions in the Biological Assessment the project is appended to the programmatic Biological Opinion. The time savings in the process occurs through prior agreement to conditions (negotiation time) and the difference between the time it takes to append the project to the programmatic opinion (30 days) and the time it takes to complete a new consultation (135 days).

4-2.6 Incidental Take Permits

Caltrans is required to obtain an Incidental Take Permit when a project without Federal participation has the potential to take a Federally listed species. This permit is often referred to as a 10(a)(1)(B) permit, which is the section in the law which states "...if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Permit application procedures can be found at 50 CFR Part 13 - General Permit Procedures, and Part 17 - Endangered and Threatened Wildlife and Plants for species under the jurisdiction of FWS. Procedures for species under the jurisdiction of NMFS can be found at 50 CFR Part 217 - General Provisions, Part 220 - General Permit Procedures, and Part 222 - Endangered Fish or Wildlife.

4-2.7 Exemption Process

When FWS/NMFS issues a Jeopardy Opinion for a project and there is no alternative to the project, there is a process in place that would allow an exemption to the ESA. However, proof must be demonstrated that not building the project would be of national concern. It is highly unlikely that Caltrans will ever seek an exemption. Instructions for application of an exemption can be found at 50 CFR Part 450 - General Provisions, Part 451 - Application Procedure, Part 452 - Consideration of Application by the Secretary, and Part 453 - Endangered Species Committee.

4-3 STATE PROCESS

4-3.1 Consistency Determination, Section 2080.1 Fish and Game Code

For projects that impact species that are listed both under the state and federal acts, Section 7 consultation has been completed and a Biological Opinion and Incidental Take Statement have been obtained, the requirements of CESA can be met if DFG determines that the Incidental Take Statement is consistent with CESA. Therefore, when conducting consultations under Section 7 of FESA you should include DFG in the consultation process.

Upon receipt of an Incidental Take Statement, the district notifies the director of DFG, in writing, that an Incidental Take Statement has been issued pursuant to the Federal Endangered Species Act of 1973 (16 U.S.C.A. Sec. 1536) and requests DFG to make a determination as to whether the Incidential Take

Statement is consistent with CESA. Submit 2 copies of the Biological Opinion and Incidental Take Statement with the request and send a copy, with attachment, to the appropriate DFG Regional Manager, since they will be conducting the actual review.

DGF will publish, in the General Public Interest section of the California Regulatory Notice Register, the receipt of that notice. Within 30 days DFG will determine whether the incidental take statement is consistent with CESA. The determination will be published in the General Public Interest section of the California Regulatory Notice Register.

4-3.2 Incidental Take Permit, Section 2081(b) Fish and Game Code

For projects that involve the take of a state listed only species, a permit must be obtained from DFG. Regulations for issuing take permits are found in Sections 783.1 through 783.8 of Title 14 of the California Code of Regulations. Normal processing of a permit application should take about four months, but can take up to seven months to complete. Fortunately, there are only 26 animal species that are state listed only. Thus, most CESA compliance should be accomplished through a determination, by DFG, that the federal incidental take authorization is "consistent" with CESA.

During the preparation of a permit application, you should consult with DFG in order to ensure that the application will meet the requirements of the regulations when submitted to the DFG. Applications for permits are submitted to the appropriate DFG Regional Manager. Each application must include all of the following:

(1) Applicant's full name, mailing address, and telephone number(s). Include the name and address of the person responsible for the project or activity requiring the permit.

(2) The common and scientific names of the species to be covered by the permit and the species' status under CESA.

(3) A complete description of the project or activity for which the permit is sought.

(4) The location where the project or activity is to occur or to be conducted.

(5) An analysis of whether and to what extent the project or activity for which the permit is sought could result in the taking of species to be covered by the permit.

(6) An analysis of the impacts of the proposed taking on the species.

(7) An analysis of whether issuance of the Incidental Take Permit would jeopardize the continued existence of a species. This analysis shall include consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (A) known population trends; (B) known threats to the species; and (C) reasonably foreseeable impacts on the species from other related projects and activities.

(8) Proposed measures to minimize and fully mitigate the impacts of the proposed taking.

(9) A proposed plan to monitor compliance with the minimization and mitigation measures and the effectiveness of the measures.

(10) A description of the funding source and the level of funding available for implementation of the minimization and mitigation measures.

(11) Certification in the following language:

I certify that the information submitted in this application is complete and accurate to the bes of my knowledge and belief. I understand that any false statement herein may subject me to suspension or revocation of this permit and to civil and criminal penalties under the laws of the State of California.

In addition, since DFG will be a responsible agency for purposes of issuing an Incidental Take Permit where Caltrans is the lead agency for purposes of CEQA compliance, the following must be included in the permit application:

(1) The name, address, telephone number and contact person of the lead agency.

(2) A statement as to whether an environmental impact report, negative declaration, mitigated negative declaration, initial study or other document has been prepared or is being considered.

(3) At the option of the applicant, a notice of preparation, notice of determination, or draft or final environmental document may be attached.

CHAPTER 5

MITIGATION AND MONITORING

CHAPTER 5

MITIGATION AND MONITORING

5-1 INTRODUCTION

5-1.1 Need for Mitigation

By the mitigation and monitoring stage of the environmental analysis process (CEQA and/or NEPA), initial impact assessment work has been completed. It has been determined that unavoidable impacts to sensitive natural resources require restoration, creation, or enhancement of the habitats affected by the proposed project. The District Biologist has initiated coordination with resource and regulatory agency staff to determine the extent of concern and controversy regarding the proposed mitigation project. The U.S. Army Corps of Engineers (ACOE) usually has final approval in wetland mitigation projects due to the Section 404 (Clean Water Act) permitting requirements. Mitigation for upland projects, such as oak woodland, fisheries, or endangered species, may involve the California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (FWS), or National Marine Fisheries Service (NMFS) as the lead approving agency.

In the mitigation development phase of the environmental analysis process, a team effort is initiated to develop project goals and objectives, prepare detailed plans, construct, and monitor the project.

5-1.2 Mitigation Activities

For purposes of this chapter, mitigation activities are defined as any biological activities performed in order to compensate for the impacts of transportation projects. Ecological restoration is another term often used to describe these actions. Activities implemented to minimize biological impacts to species or habitats may also be included. Mitigation activities vary widely. Some of the most common types are:

- creation, restoration, or enhancement of general habitat types (i.e., wetlands, oak woodlands);
- creation, restoration, or enhancement of specific habitat for sensitive species (i.e., elderberry plantings for the Valley Elderberry Longhorn Beetle, nesting habitat for Least Bell's vireo);
- structural modifications for sensitive species (i.e., wildlife crossings, fisheries enhancements, desert tortoise fencing);
- habitat modifications to remove predators for sensitive species (i.e., cowbird trapping); and
- providing funds for habitat creation or enhancement by others in private preserves or mitigation banks.

This chapter will focus on the first two types of mitigation activities since they are the most common and can be complex for medium to large-scale projects.

5-1.3 Other Resources

Biological habitat mitigation is a complex endeavor. This chapter does not attempt to provide a comprehensive guide to all aspects of designing and monitoring a Caltrans mitigation project. There are numerous publications that detail habitat creation and/or restoration. Many of those references are provided in Section 5-3, Suggested References. The reference section also includes a list of professional associations involved in the study of ecological restoration. Many Caltrans biologists maintain memberships with one or

more of these organizations. Annual and special focus group meetings provide exposure to current methods and theories in this multidisciplinary field.

Networking with other biologists, landscape architects, erosion control specialists, and others within and outside Caltrans is also a valuable way to gain knowledge about ecological restoration.

5-2 MITIGATION DEVELOPMENT TEAM PROCESS

The District Biologist is responsible for providing a complete description of the proposed biological impacts in the Natural Environment Study (NES) and/or a supplemental Wetlands/Waters Delineation Assessment Report (WDAR), where major impacts to wetlands are involved. During project meetings with resource and regulatory agency staff, the biologist gathers suggestions regarding mitigation requirements for permitting purposes. This information is used to prepare preliminary goals and objectives of the mitigation project.

5-2.1 Identification of Goals and Objectives

Goals. The typical overall goal for habitat mitigation is that the mitigation project will replace the functions and values of the habitat affected by the transportation project. An example of a mitigation goal might be as follows:

> *"Create two acres of elderberry habitat suitable for the Valley Elderberry Longhorn Beetle."*

Objectives. Objectives are specific sub-components of goals such as the following example:

> *"The site shall create two acres of elderberry plants at a planting density of 200 per acre with at least 75% survival over the five year monitoring period."*

Specific objectives will be dependent upon the suitability of the proposed mitigation site. Special attention should be paid to the wildlife species for which the habitat is being created. These will be the species affected by the transportation project. If attention is not given to the specific needs of the wildlife species, the mitigation site may only represent the creation of vegetative associations. If the transportation impacts were on nesting habitat, for example, and a vegetative association suitable only for forage is constructed, the mitigation goals will not be met.

Historically, there has been more emphasis on assessment of the functions and values of mitigation sites, through the monitoring process, than assessment of areas to be destroyed by project impacts. Affected areas may be mapped and wetlands delineated. However, the rigor of impact analysis is rarely comparable to mitigation monitoring effort. As a result, the habitat goals of the mitigation site may not be proportional to the actual functions and values of the affected habitat. In order to refine this process and ensure that mitigation matches the project impacts, thorough evaluation of impacted areas should be completed through the Natural Environment Study process. Basic parameters such as cover, density and species frequency should be evaluated in impact analysis as a basis for mitigation site development.

In addition to goals and objectives, a preliminary schedule and budget should be developed in this early stage. Preliminary requirements for the mitigation activity (for example, acreage needed for habitat-scale projects) or the source of funds for banking (State or private), should be identified.

5-2.2 Forming the Mitigation Development Team

The District Biologist may take the lead in forming an informal or formal Mitigation Development Team (MDT). A formal team is most effective for typical projects. The team represents the various disciplines often required in designing and constructing successful mitigation projects. The team should include the Project Manager, Project Engineer, and representatives from Environmental Planning, Landscape Architecture, Hydraulics, Maintenance, and Construction Programs. The team will focus on translating

goals into objectives and developing a conceptual mitigation plan, followed by a detailed project proposal. During this time, the biologist continues as agency liaison for coordinating with the resource and regulatory agency staff. If the project includes any consultants under contract to prepare studies outside the skills of Caltrans staff (hydrology, biostatistics, soil science, fisheries, etc.), these individuals shall also be a part of the team. Although Cultural Resources and Hazardous Waste staff may not be formal members of the team, coordination should be made with these units as a part of the site design process, where appropriate. Resource agency staff should also be team members, although their schedules may only allow for attendance at critical meetings.

The responsibility for preparing a central file for project information is often overlooked. A central project file should be established. All team members should be required to file copies of meeting notes, project plans, consultations, project decisions, etc. in a central location to provide an institutional or corporate memory in case of staff changes on the team.

Since there are no Caltrans policies that clearly describe the responsibilities of a MDT, it is imperative that team member roles are clarified early in the process. The Project Manager must provide approval of the mitigation concept and preliminary budget. The Landscape Architect and other team members may work primarily to address the practicality of translating the concept to reality. Typically, staff from Project Development, Landscape Architecture, or their contractors, prepare project plans for construction.

Whether working as lead, co-lead, or team member, the District Biologist must provide input on the habitat aspects of the proposal. It is imperative that the commitments made in the environmental document are used to direct mitigation design.

For wetland and upland habitat projects, the biologist may provide a proposed plant species list, planting densities and layout, and site elevations to accommodate species requirements. The biologist should also present an aquatic species list, where applicable. Key information about target wildlife species and their habitat requirements is included in the preliminary input to the team. For aquatic habitat projects, detailed information on water depth, riffle to pool ratio, temperature, velocity, and substrate characteristics may be required. When fish passage is an issue, water depths, water velocities, swimming ability of fish, culvert length, and jump heights should be a part of the information supplied by the biologist. For a project that requires modifications in aquatic stream habitat it is imperative that a hydrologist/stream morphologist be involved in the process.

When the District Biologist is not knowledgeable about a particular species or habitat, assistance should be sought from other Caltrans biologists, resource agencies, or a consultant. Proposed designs for wildlife crossings and other structural mitigation should be reviewed by biologists knowledgeable about such devices.

5-2.3 Mitigation Alternatives Analysis

The MDT should analyze the methods available to meet the mitigation goals. Species-specific improvements may involve planning activities such as predator trapping, wildlife crossings and/or fences, or the creation of nesting habitat. Where available, mitigation banks are another option for general habitat mitigation. Caltrans is actively developing mitigation banks throughout the state.

Since habitat restoration, general or species-specific, is one of the most common mitigation activities, the following sections detail considerations to be made in a feasibility study analyzing potential mitigation sites.

The site selection process for mitigation project location includes the following considerations:

- conservation easements as an alternative to right of way purchase;
- avoid purchasing or improving habitat on small isolated sites;
- habitat restoration on lands managed by conservation agencies;

- acquiring sites that are adjacent to other lands that are managed for conservation purposes; and
- developing mitigation banks when appropriate opportunities exist.

Potential mitigation sites should be evaluated regarding physical factors as well as consider future development plans which may affect those sites. Written approval of mitigation site selection by the Project Manager may reduce future conflicts regarding implementation of a site design. Caltrans departments involved in plan review/approval include, but are not limited to, Maintenance; Landscape Architecture; Right of Way and Hydraulics.

The MDT must also consider how mitigation development on prospective sites affect neighboring properties. For example, urban neighbors may have concerns about potential effects of mosquitoes from a wetland development. Rural neighbors may have concerns about effects on agricultural crops by wildlife attracted to a mitigation site.

Onsite mitigation is usually limited to small, low habitat value, mitigation activities. Offsite mitigation usually occurs where large acreage is required. Submissions for suitable sites may be obtained from a variety of sources. Right of Way Program staff may be able to provide a list of excess lands which should be considered for mitigation since no acquisition costs are required. Right of Way agents may know of parcels available in the project area through foreclosures or otherwise. Local, State, or Federal agencies may have lands where mitigation could be implemented with Caltrans under a Memorandum of Agreement or Memorandum of Understanding. All reasonable considerations should be taken into account to select the best mitigation site option.

Mitigation banking may be an option where Caltrans has planned in advance for potential impacts to specific habitat types. Private mitigation banks are also an option that has recently become available for some habitat types. The ACOE has developed a banking agreement procedure which should be used where mitigation for impacts to wetlands and other aquatic resources is involved (ACOE, et al. 1995).

Evaluation of possible sites for project mitigation should focus on habitat considerations, ownership specifics, and acquisition costs. Maintenance of the mitigation site in perpetuity should be fully addressed. Internal agreements with the Maintenance Program should be signed, as appropriate. Where Caltrans is unable to take the responsibility of long-term maintenance, the terms of temporary and permanent site management must be made in writing with any other parties involved.

Team members may benefit from creating a checklist for each project to assure that all important factors are considered at this early stage. Site selection should not be approved until team members have assurance that the site has the potential to meet the project goals. This preliminary investigation should include cultural resources and hazardous waste investigation. Using this process, site selection will match project needs. Onsite and offsite proposals should receive equal scrutiny. The availability of areas within the right of way should not influence the selection process such that an inappropriate site is chosen simply because it is available. Areas within Caltrans' right of way have often been compacted and otherwise altered resulting in areas inappropriate for habitat restoration or creation. Ongoing maintenance activities in the right of way and their potential impacts to habitat restoration are other important considerations, as previously mentioned.

One or more reference data sites should be evaluated in the development of the monitoring plan. A reference site contains the same habitat type and is within the region of the mitigation site. Such sites may be mature habitat and can be used for developing mitigation goals. Some references of early stage habitats may also be assessed to determine interim mitigation site goals. Performance criteria for the project are developed following collection of field data of plant species and/or other aspects at reference sites.

The following list adapted from Rieger and Traynor (1994) shows site factors that should be considered in any evaluation of potential mitigation sites.

General Factors:

- Political considerations
- Regulatory agency approval
- Historical context
- Hazardous waste
- Resource constraints
- Historical/Archeology
- Wildlife
- Vegetation
- Water rights
- Human use patterns
- Current and ultimate site ownership
- Constraints
  - Easements, rights of entry
  - Agricultural quarantines
- Land use compatibility
- Acquisition cost
- Site stewardship, short and long-term

Physical Factors:

- Hydrology
  - Groundwater
  - Surface water
- Soil characteristics
  - Organic matter
  - Texture
  - pH
  - Water capacity
- Topography
  - Elevation
  - Slope and aspect
- Water quality

Biological factors:

- Historic evolution of existing vegetation
- Habitat values and features
- Degree of degradation

Wildlife resources (existing and/or proposed)

Plant species (existing and/or proposed)

Sensitive species (existing and/or proposed)

Vegetation succession

Potential predators, weed species (existing and/or potential)

Habitat buffer zones

Following consideration of site factors, a conceptual mitigation plan, including cost estimates, should be prepared for the selected site. The Project Manager is responsible for providing preliminary approval. The biologist should ensure that the concept and location are acceptable to the Federal Highway Administration (FHWA), if Federal funds are involved in the mitigation.

The regulatory and resource agencies responsible for approving the permit action requiring the mitigation should also approve the mitigation proposal. The conceptual plan should be made available for their review so any important issues can be considered prior to site acquisition or approval. This agency review step would also apply to projects where structures are being designed. The MDT should prepare a written feasibility report, including the conceptual plan and a preliminary budget that includes funding for post-construction monitoring, maintenance, and stewardship costs. The Project Manager is responsible for providing the biologist with final written approval of the plan. Future design changes should also require written approval from the Project Manager. This approval represents an in-house procedure that helps to assure compliance.

5-2.4 Design Development

Following written approval of the mitigation plan, the MDT leader should direct the team to assemble all required resources for preparing a detailed project design. Detailed design may require input from a wide variety of specialists. Typical areas of responsibility are:

Plant Ecologist:

Suitability of the plant species and planting plans for the desired plant community; plant succession; current methods of designing and monitoring ecological restoration projects.

Wildlife Ecologist:

Habitat requirements of target wildlife species; field monitoring design and implementation.

Agronomist/Horticulturist:

Matching planting techniques to unique site characteristics.

Fisheries Biologist:

Habitat requirements of target fish species; field monitoring design and implementation.

Statistician:

Statistical aspects of post-construction monitoring; reference site sampling design.

Landscape Architect:

Planting design preparation (grading, fill); irrigation; weeding techniques; all aspects of plant establishment and monitoring.

Hydrologist:

Hydrodynamics in natural stream and open water systems.

Fluvial Geomorphologist:

Specific aspects of stream morphology and evolution.

Erosion Control Specialist:

Design and monitoring of erosion control specifications.

Geologist:

Suitability of subsurface conditions for proposed grading or filling activities.

Soil Scientist:

Determination of soil properties which affect project design, such as texture and water holding capacity.

Civil Engineer:

Design of roadways, bridges, water structures, and other similar features.

During the design phase, the MDT may perform and/or direct detailed site studies to collect information for design purposes. These activities may include groundwater monitoring, stream surveys, vegetation inventories, climatic data, and many other types of information.

Projects that involve vegetation planting commonly deal with the following factors at different stages of the site design process (adapted from Rieger and Traynor 1994):

Site Preparation Stage:

- Grading and drainage
- Weed control, removal of invasive non-native plants
- Soil ripping
- Soil augmentation
- Topsoiling
    - Seed bank
    - Over excavation (removing upper soil layer with weed seed)
- Erosion control

Plant Materials Selection Stage:

- Plant species list
    - Quantities required
    - Preferred type of planting stock
    - Appropriateness to wildlife species involved
    - Recommended sources of plant material
        - Localities for collection of materials
        - Material appropriate to the locality or region (gene pool)
        - Lead-time required for procurement
    - Recommended planting time

Planting Design and Layout Stage:

- Planting zones
- Desired percent composition for plant species
- Plant mixes/planting associations
- Planting spacing and density
- Seed mix and application rate

Irrigation System Design Stage:

- Plant species water requirements
- Demand analysis
    - Location of water source
- Preferred type of irrigation
- Control and monitoring systems
- Irrigation schedule

Plant Protection Design Stage:

- Vandalism protection
- Environmental factors
    - Staking
    - Sun protection
    - Insect protection
    - Weed control
    - Fungal protection
    - Browse protection

5-2.5 Final Plans, Specifications, and Estimates

The final Plans, Specifications, and Estimates (PS&E) may be prepared by the Landscape Architect and Project Engineer with assistance from the other MDT members. PS&E includes staging, scheduling, specifications, and special provisions of the mitigation construction project.

5-2.6 Construction Monitoring

After project plans have been prepared and/or approved by Caltrans staff or its contractors, implementation of the design becomes the responsibility of Caltrans' Construction Program. Members of the mitigation team will be responsible for advising Construction staff if, during field reviews, they determine that all components of the plan have not been constructed as designed. In some planting projects, the Landscape Architect may serve as the lead in plan development and act as the Resident Engineer in the construction phase.

The Landscape Architect conducts oversight of the landscape contractor and implementation of plant establishment. The plant establishment period is defined as the time when plants are watered, weeded, and otherwise maintained for survival. It may vary from one to three years, depending on the project.

5-2.7 Post-Construction Monitoring

The District Biologist is responsible for developing and implementing a monitoring plan to determine whether the mitigation meets the agreed upon goals and objectives of the project outlined in the environmental document. Monitoring for a minimum of five years is a standard amount of time for general habitat mitigation; however, regulatory agencies often require more time for large, controversial wetland projects. Where wetland habitat is affected, the ACOE guidance entitled *Habitat Mitigation and Monitoring Proposal Guidelines* should be followed. Each ACOE district has its own version of the guidelines; therefore, the District Biologist should ensure that they are using those guidelines appropriate for their district.

Monitoring habitat mitigation projects is a complex subject. There are diverse opinions as to what activities should be performed, as well as how and when they should be done. There is general agreement, however, that the reason for monitoring is to evaluate the mitigation project in order to take the necessary remedial actions and ensure project success. The District Biologist should work closely with other district and headquarters staff to determine whether the proposed mitigation meets standards set by previous Caltrans work. Regulatory agency requirements far above these informal standards should be scrutinized. Justification should be provided for extensive monitoring proposals.

Post-construction monitoring in ecological restoration will determine whether a site is trending toward development of mature habitat. In addition, valuable information may be obtained to aid in planning and design of future projects. Since monitoring funds are very limited, it is important that the monitoring activities are closely aligned with the original mitigation goals.

Monitoring activities should be clarified to determine if information is being gathered for general purposes or for specific site management. General purpose information includes information that is of interest, but may not be directly connected with managing the site. Monitoring thresholds are an example of a specific site management issue. If a threshold is not met within a certain time, then a specific management action would be performed. For example, if the threshold of 40% vegetative cover of target species is not met at the second year, weeding practices would be modified.

Monitoring may involve the collection of quantitative and/or qualitative data. Specific quantitative criteria may be developed, or qualitative activities, such as photographic documentation, may be used. Many monitoring plans focus entirely on evaluation of vegetation. Plant cover, density, vigor, and species composition are commonly measured. However, there is a trend toward measuring whether the target wildlife species have actually inhabited the mitigation site. Biologists should work with resource agency staff to give full consideration to collecting trend data as an alternative to quantitative performance criteria. If the data show that the project is trending toward habitat development, negotiated resource agency approvals may be obtained.

Annual monitoring reports are prepared by the District Biologist and are submitted to the appropriate regulatory and resource agencies.

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5-3.6 General References

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5-3.7 Professional Associations

American Fisheries Society

Association of State Wetland Managers

California Exotic Pest Plant Council

California Native Grass Association

California Native Plant Society

Society for Ecological Restoration

Society of Wetland Scientists

The Wildlife Society